



## Electrochemical detection of pyocyanin as a biomarker for bacterial infections

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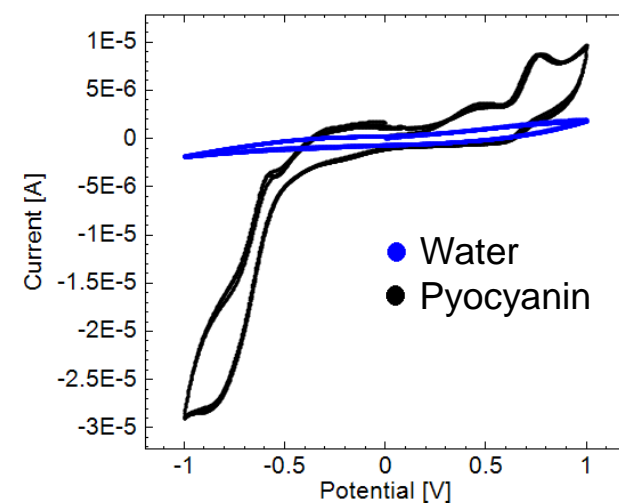
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## Motivation

The redox-active pyocyanin is produced by *P. aeruginosa* during infections and is released prior to virulent activity. Monitoring the level of pyocyanin as an infection biomarker could enable early detection of bacterial infections.

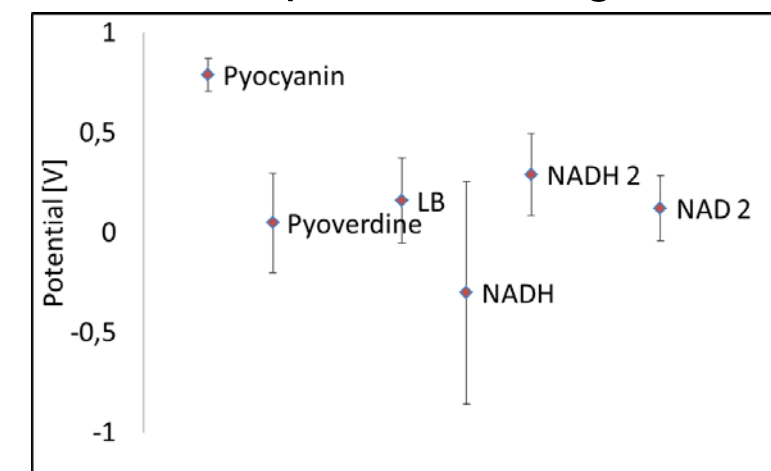
1

Cyclic voltammogram  
– The fingerprint of pyocyanin



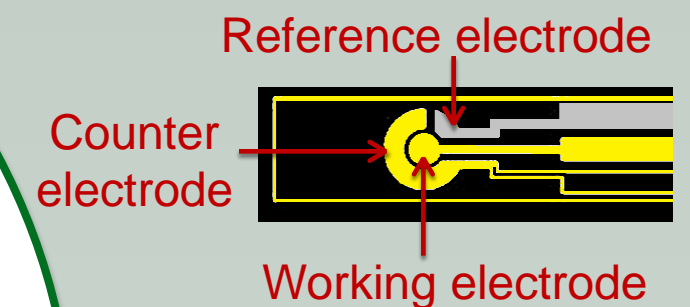
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Selective detection of pyocyanin  
- No overlap between signals



## Concept

Electrochemical sensing of pyocyanin is conducted using micro-sensors. The sensor consists of three electrodes and requires only micro-liter volume of the sample.



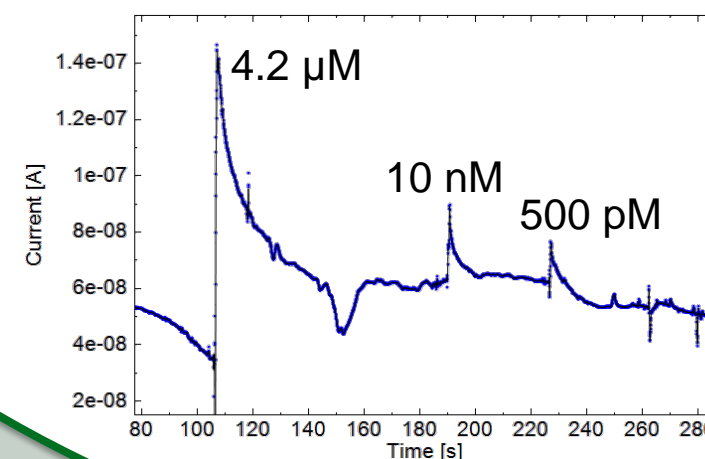
# Electrochemical detection of pyocyanin as a biomarker for bacterial infections

## Impact

Development of this novel detection technique will optimize early diagnosis of bacterial infections and lead to new guidelines in this area. The information revealed by pyocyanin sensing will be of great value when designing new antibiotic treatment strategies.

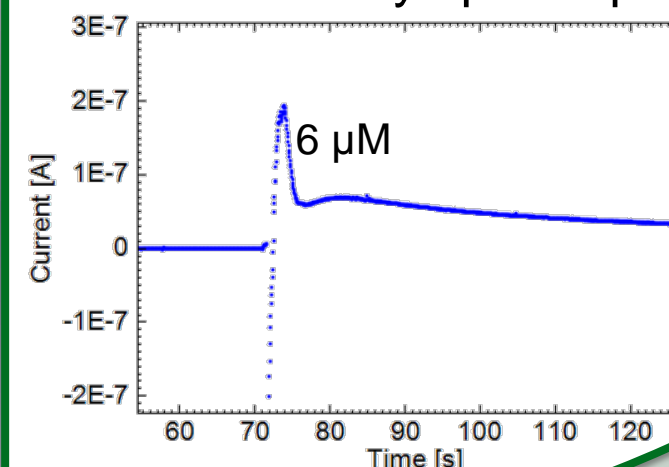
3

Chronoamperometry  
– Quantification of pyocyanin below detection limit of HPLC (7.2  $\mu$ M)



4

Detection of pyocyanin in isolate from cystic fibrosis patient  
- No pyocyanin was detected in isolate by spectrophotometry!



## Summary

A precise and early diagnosis of an infection is essential for successful eradication treatment. Hence early diagnosis has direct impact on the morbidity and mortality of patients. This can be achieved by electrochemical micro-sensing of pyocyanin as an infection biomarker.

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